

REMARKS

Claims 19 to 34 continue to be under consideration.

The Office Action refers to Claim Rejections - 55 USC § 112

Claim 33 stands rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is insufficient antecedent basis for the limitation "larger loads" in the claim because no previous "load" has been stated.

Applicant is correcting claim 33 in the present amendment.

The Office Action refers to Claim Rejections - 35 USC § 103

3. Claims 19-20, 23-26, and 29-34 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Bignucolo et al. (US Patent 6,513,243) in view of Meredith (US Patent 5,074,555). Bignucolo et al. discloses a method of producing a hollow molded part made of a metallic material in a shape of an A-column having a tubular starting part (1) with an outer diameter and a starting wall thickness (Figure 1). Initially the tubular starting part reduces, by radial deformation performed by rolling (fluoforming, rollers, Column 2, lines 32-35), a second conical region (5) and a third cylindrical region (4) to a smaller diameter (Column 2, lines 36-41) to form a mold blank (a hollow first intermediate product 2). The mold blank's second conical region is then bent under axial pull tension to a curvature

(Column 2, lines 43-55, Figure 3). A final forming step is performed by inner high pressure metal forming (hydroforming) in the first and in the second regions (Column 2, lines 66-67 & Column 3, 1-4; Figure 6).

Applicant respectfully disagrees.

The reference United States patent 6,513,243 to Bignucolo teaches a method for the production of front axles of industrial vehicles.

A tube is used as a starting part, which exhibits a starting wall thickness. The following process steps are being performed:

A. The tube is reduced at the two ends in its diameter in a first preform step, which is designated as fluoforming. An intermediate product is generated with a central cylindrical section 3, which exhibits the same diameter as the starting tube, with two cylindrical ends 4, wherein the cylindrical ends 4 have a smaller diameter as compared the central section and with two intermediately disposed frustro conical shaped sections 5. Figure 2 of the reference Bignucolo et al. does not allow to recognize the course of the wall thickness in the individual sections.

B. In the following the intermediate product 2 illustrated in figure 2 is subjected to a second preform step. The pressing or upsetting is performed in a press with

relatively small closure forces, wherein the central section 3 obtains an essentially elliptical cross-section 6b and the sections 4 and 5 are bent upwardly relative to the central section. A further intermediate product 6 was generated.

C. The intermediate product 6 is inserted into a finisher and subjected to a third preform step during which the intermediate product 6 is pressed against the walls of a finisher such that the intermediate product 6 receives a form coming close to the finished axle and exhibits a rectangular cross-section (figure 4) and therewith generates a further intermediate product 7.

D. Then the semi finished product 7 is subjected to a hydro forming and thereby the finished axle 8 is obtained (figure 5 and figure 6).

E. Then two separate reinforcement devices 9 are mounted to the axle 8.

The reference Bignucolo et al. does not provide any information in the description relative to the course of the wall thickness of the five process steps.

However the intermediate product 6 is three-dimensionally illustrated in figure 8 and the intermediate product 7 is illustrated three-dimensionally in figure 9, where it is recognizable that the cross-sections reduce from a central region toward the ends. However according to figure 8 the wall thickness is always the

same from the central region 16 to the end sections 21. The wall thickness of the finished axle 22 illustrated in figure 9 is always the same from the central section 23 to the end section 26.

Employing the disclosure of the present application it is unnecessary to mount two separate reinforcement devices at the axle as is required according to the reference Bignucolo et al., since larger wall thicknesses could be generated in the region of the required reinforcements.

Since no larger wall thicknesses are generated according to the United States patent 6,513,243, it is then necessary to mount additional reinforcement devices.

Bignucolo et al. discloses the invention substantially except for an increased wall thickness relative to the starting wall thickness in the second and third regions. Meredith discloses a method of radially deforming a tubular shaft having second (61) and third (62) regions with an increased wall thickness (22) relative to the starting wall thickness (20) (Column 3, line 55-56 and Figures 2a-b). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that Bignucolo et al.'s radial deformation step can increase the wall thickness of the second and third region because "it is desirable to design (a

tubular part) without the excessive weight (and) having a wall thickness along the tapered length (second region) and the tip portion (third region) able to provide a desired weight distribution and to withstand the forces exerted on the shaft tip (third region)" (Column 1, lines 45-50).

A method for the production of a sporting article is proposed in United States patent 5,074, 555 to Meredith, wherein a metal shaft is formed by around forming and drawing us and which metal shaft exhibits different wall thicknesses.

Applicant respectfully submits that the production of a sporting article is completely unrelated to the production of an axle of a motor vehicle.

4. Claims 21-22 and 27-28 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Bignucolo et al. and Meredith as applied to claims 19-20 and 23-24 above, and further in view of Self et al. (US Patent 2,267,623). The combination of Bignucolo et al. and Meredith disclose the invention substantially except for an intermediate annealing prior to the pressure forming and annealing between the deformation step and the pressure forming step. Self et al. discloses an intermediate annealing after a deformation step (Column 2, lines 35-39). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to anneal the product in order to prevent "failure of the blank" (Column 5, lines 69-70) in a manner such as cracking or breaking before further forming is performed.

Applicant respectfully traverses.

The Office Action refers to the reference United States patent 2,267,623 to Self et al. This reference Self et al describes a completely different method for the production of burner nozzles, which has nothing to do with the invention method. It is described that a heat treatment can be performed, however the burner nozzle is completely different produced.

It is concluded that the state of the art does not furnish a single piece A-column, where a reinforcement can be provided by a directed thickening of the wall thickness.

Reconsideration of all rejections is respectfully requested.

All claims are believed to be in allowable form and a Notice of Allowance is earnestly solicited.

Respectfully submitted,
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